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### REMARKS

The present response is intended to be fully responsive to all points of objection and/or rejection raised by the Examiner and is believed to place the application in condition for allowance. Favorable reconsideration and allowance of the application are respectfully requested.

Applicants assert that the present invention is new, non-obvious and useful. Prompt consideration and allowance of the claims are respectfully requested.

### Status of Claims

Claims 1-23 are pending in the application.

### CLAIM REJECTIONS

#### 35 U.S.C. § 103 Rejections

In the Office Action, the Examiner rejected claims 1-23 under 35 U.S.C. § 103(a), as being unpatentable over Liu et al. (US 2002/0197013) in view of Wiesmann et al. "Large UV-induced negative index changes in germanium-free nitrogen-doped planar SiO<sub>2</sub> waveguides".

Applicants respectfully traverse the rejection of claims 1-23 under 35 U.S.C. § 103(a), because a prima facie case of obviousness has not been established, as discussed below.

As is well established, in order to establish a prima facie case of obviousness, the prior art references must teach or suggest all the claim limitations.

As discussed below, Applicants respectfully submit that neither Liu et al. nor Wiesmann et al. describe teach or fairly suggest a Bragg grating including a plurality of alternating elements of first and second, different, substantially electrically insulating materials (emphasis added), as recited, in paraphrase, by independent claims 1, 6, 11 and 19.

In the Office Action the Examiner acknowledged that Liu et al. does not teach or fairly suggest a plurality of alternating elements including different types of Silicon

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Oxynitride and that the elements differ in their relative concentration of Oxygen and Nitrogen. However, the Examiner contended that Wiesmann et al. teach that SiON is commonly used in planar optical devices such as waveguides and Bragg gratings. The Examiner also contended that Wiesmann et al. teaches exposing a SiON waveguide to UV light to create an alternating pattern to make a Bragg grating. The Examiner further contended that the exposed areas would alternate with unexposed areas, and the areas would differ in their concentrations of Oxygen and Nitrogen.

As acknowledged by the Examiner, Liu et al. does not describe, teach or fairly suggest a Bragg grating including a plurality of alternating elements of first and second, different, substantially electrically insulating materials, as recited, in paraphrase, by independent claims 1, 6, 11 and 19. Applicants respectfully traverse the Examiner's contention that this deficiency of Liu et al. can be cured by Wiesmann et al., as discussed below.

In the portions of Wiesmann et al. cited by the Examiner, Wiesmann et al. merely describes inducing refractive index changes in a waveguide formed of a SiON material, by exposing the waveguide to UV light. It is respectfully asserted that Wiesmann et al. does not describe, teach or fairly suggest a Bragg grating including first and second, different materials.

Applicants respectfully note that the different types of SiON described by Wiesmann et al. (first paragraph) are mere examples given by Wiesmann et al. of the different types of SiON which may be used for waveguides: "The refractive index can be varied from 1.45 (SiO<sub>2</sub>) up to 2.00 (SiN<sub>4</sub>)" (First paragraph). However, it is respectfully submitted that the waveguide described by Wiesmann et al. is fabricated from a single type of SiON. The Bragg grating described by Wiesmann et al. is achieved by exposing the waveguide of the single type of SiON to UV light. In contrast to the Examiners contention, it is respectfully asserted that Wiesmann et al. does not disclose or suggest in any way that the exposure to the UV light affects the concentrations of Oxygen and Nitrogen. Therefore, Wiesmann et al. does not describe, teach or fairly suggest a Bragg grating including first and second, different materials, as recited by independent claims 1, 6, 11 and 19 of the present Application.

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Additionally, In the portions of Liu et al. cited by the Examiner, e.g., paragraphs 22-31, Liu et al. refers to a Bragg grating (elements 113 and 201 in Figs. 1 and 2, respectively) including alternating regions of polysilicon (elements 117 and 205 in Figs. 1 and 2, respectively), and a semiconductor substrate (elements 105 and 203 in Figs. 1 and 2, respectively). As is well known in the art, a semiconductor substrate is intermediate in electrical conductivity between an electrically insulating material and an electrically conductive material. In other words, a semiconductor substrate, by definition, is neither electrically conductive nor electrically insulating. Accordingly, Applicants respectfully assert that the semiconductor regions described by Liu et al. are clearly not of an electrically insulating material. Therefore, Liu et al. teaches away from a Bragg grating including first and second, different substantially electrically insulating materials, as recited by independent claims 1, 6, 11 and 19 of the present Application.

Furthermore, even if a person skilled in the art would have been motivated to combine the Bragg grating of Liu et al. with the single SiON material of Wiesmann et al., as suggested by the Examiner, and contrary to applicants' position that such a combination would be improper and unreasonable, still, a structure resulting from a combination as suggested by the Examiner would include alternating regions of the semiconductor substrate, since the Bragg grating described by Liu et al. is formed by disposing the polysilicon elements in the semiconductor substrate. In other words, combining the Bragg grating described by Liu et al. with the single SiON material described by Wiesmann et al. would not result in a grating that includes a plurality of alternating elements of first and second, different, substantially electrically insulating materials, as recited, in paraphrase, by independent claims 1, 6, 11 and 19.

Claims 2-5 depend, directly or indirectly, from independent claim 1 and incorporate all the elements of this claim. Claims 7-10 depend directly from independent claim 6 and incorporate all the elements of this claim. Claims 12-18 depend, directly or indirectly, from independent claim 11 and incorporate all the elements of this claim. Claims 20-23 depend directly from independent claim 19 and incorporate all the elements of this claim. Therefore, it is respectfully submitted that claims 2-5, 7-10, 12-18 and 20-23 are patentable, and thus allowable, at least for the reasons set forth above.

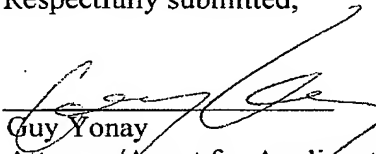
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In view of the foregoing amendments and remarks, the pending claims are deemed to be allowable. Their favorable reconsideration and allowance are respectfully requested.

Should the Examiner have any question or comment as to the form, content or entry of this Amendment, the Examiner is requested to contact the undersigned at the telephone number below. Similarly, if there are any further issues yet to be resolved to advance the prosecution of this application to issue, the Examiner is requested to telephone the undersigned counsel.

Please charge any fees associated with this paper to deposit account No. 50-3355.

Respectfully submitted,

  
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